

THE COMING DRY SEASON
ASTRONOMY POLICY
2010 AND BEYOND
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4/8/2010 – JPL

What is astronomy policy?



- Actions that impact astronomy
 - ▣ Presidential priorities – Earth Science vs. Human Space Flight vs...
 - ▣ Agency decisions - e.g. the importance of research grants vs. projects...
 - ▣ Funding decisions...balance of investment
 - ▣ To build or not to build
 - ▣ To cancel or not to cancel
 - ▣ Rules regulating publishing or data archiving
 - ▣ Visa issues relating to free movement of scientists

Congress and Science funding



- In Astronomy (and other sciences), the government is the major funder of research.
- Actions the government takes can negatively impact our research...big time.
- If you don't make noise, you don't exist.

Where does Astronomy get its funding?



- NASA

- ▣ ~ 75% of total, mainly related to space missions

- NSF

- ▣ ~ 15% of total, minimal planetary funding

- Department of Energy (DOE)

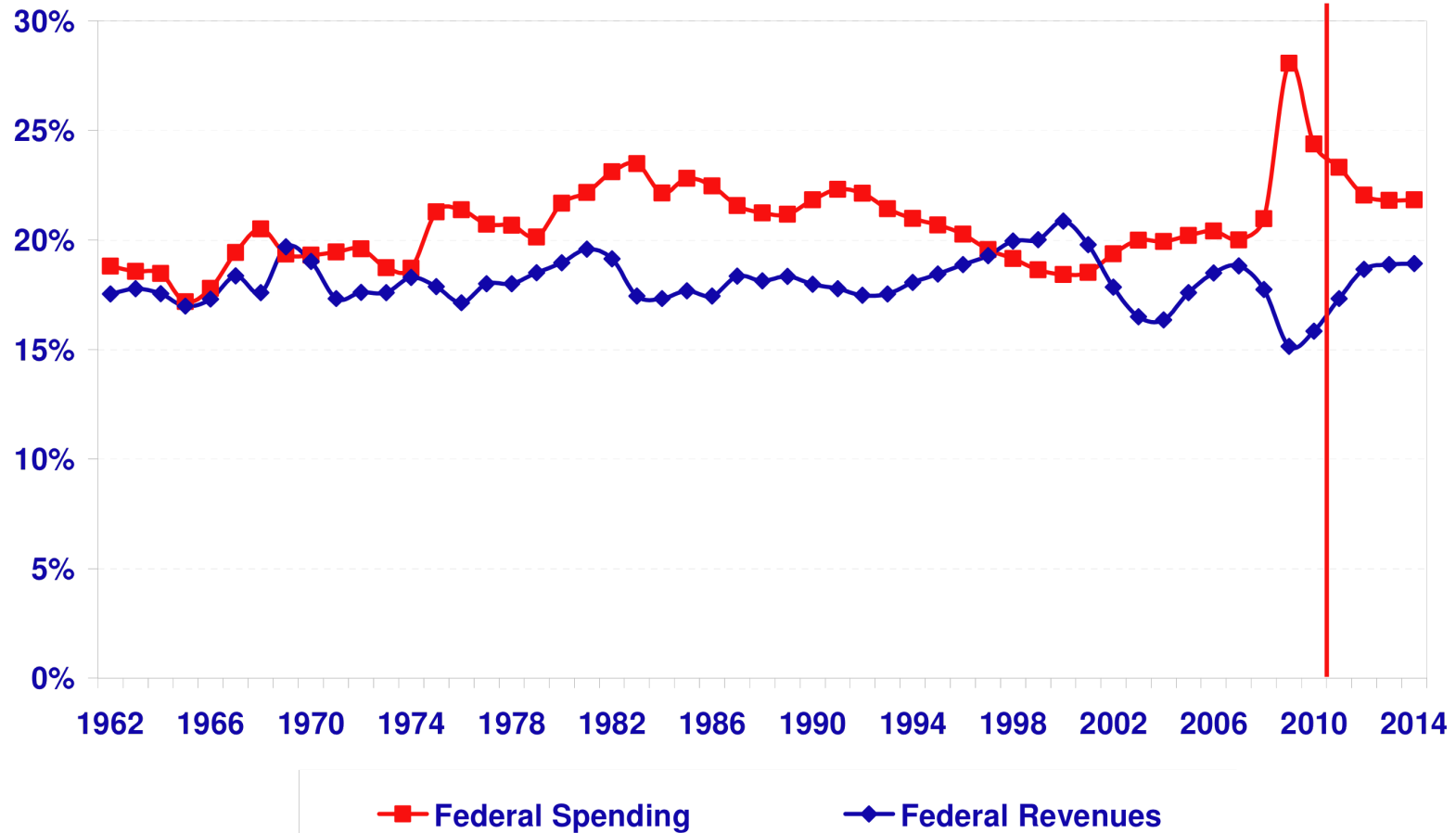
- ▣ ~ 5% of total, mainly high energy astrophysics

- Department of Defense (DOD)

- ▣ ~5% of total, for 'military' purposes

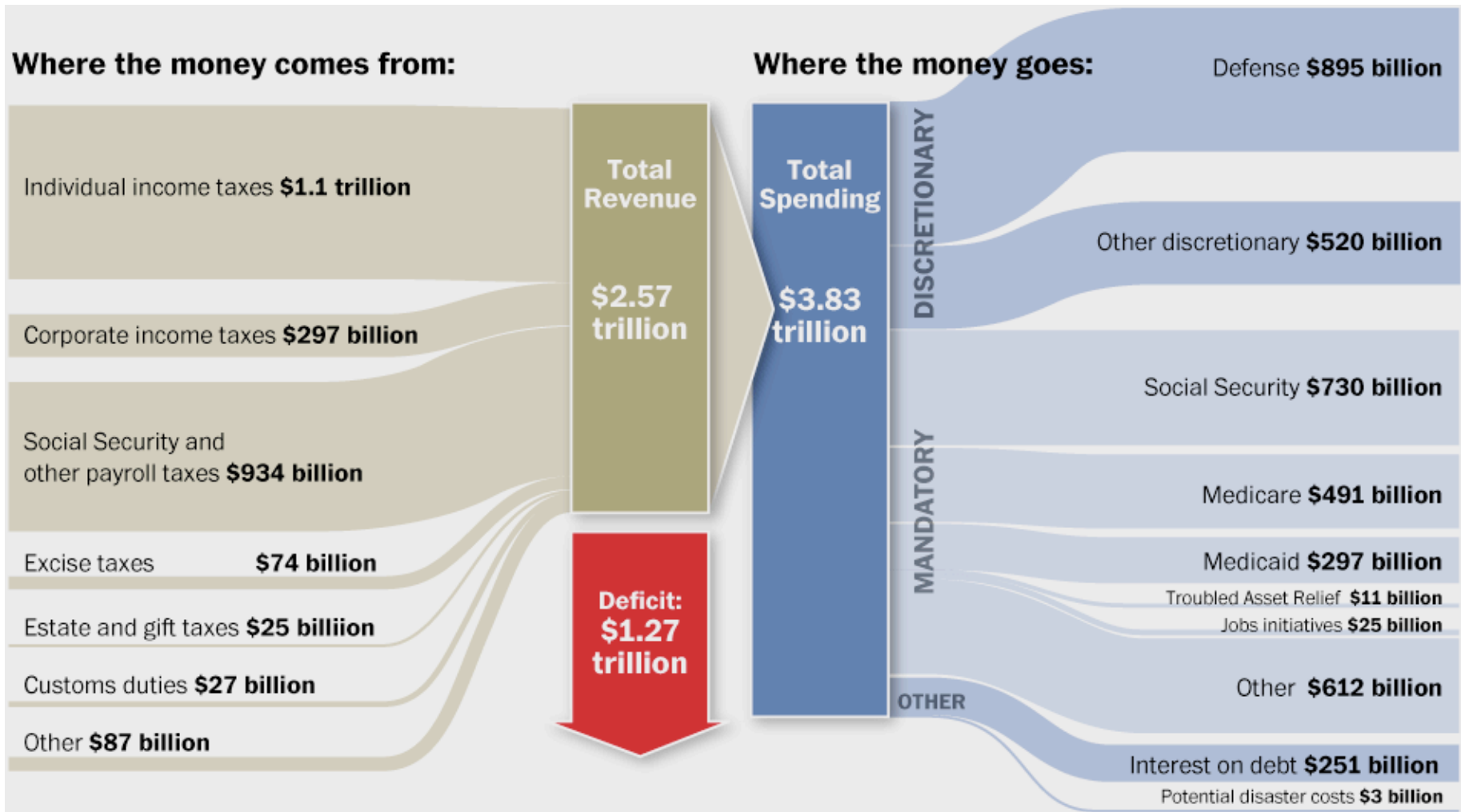
Federal Spending and Revenues

(percent of GDP)



Source: *Budget of the United States Government, FY 2010*.
FY 2009 data are estimates. FY 2010-2014 data are budget projections.
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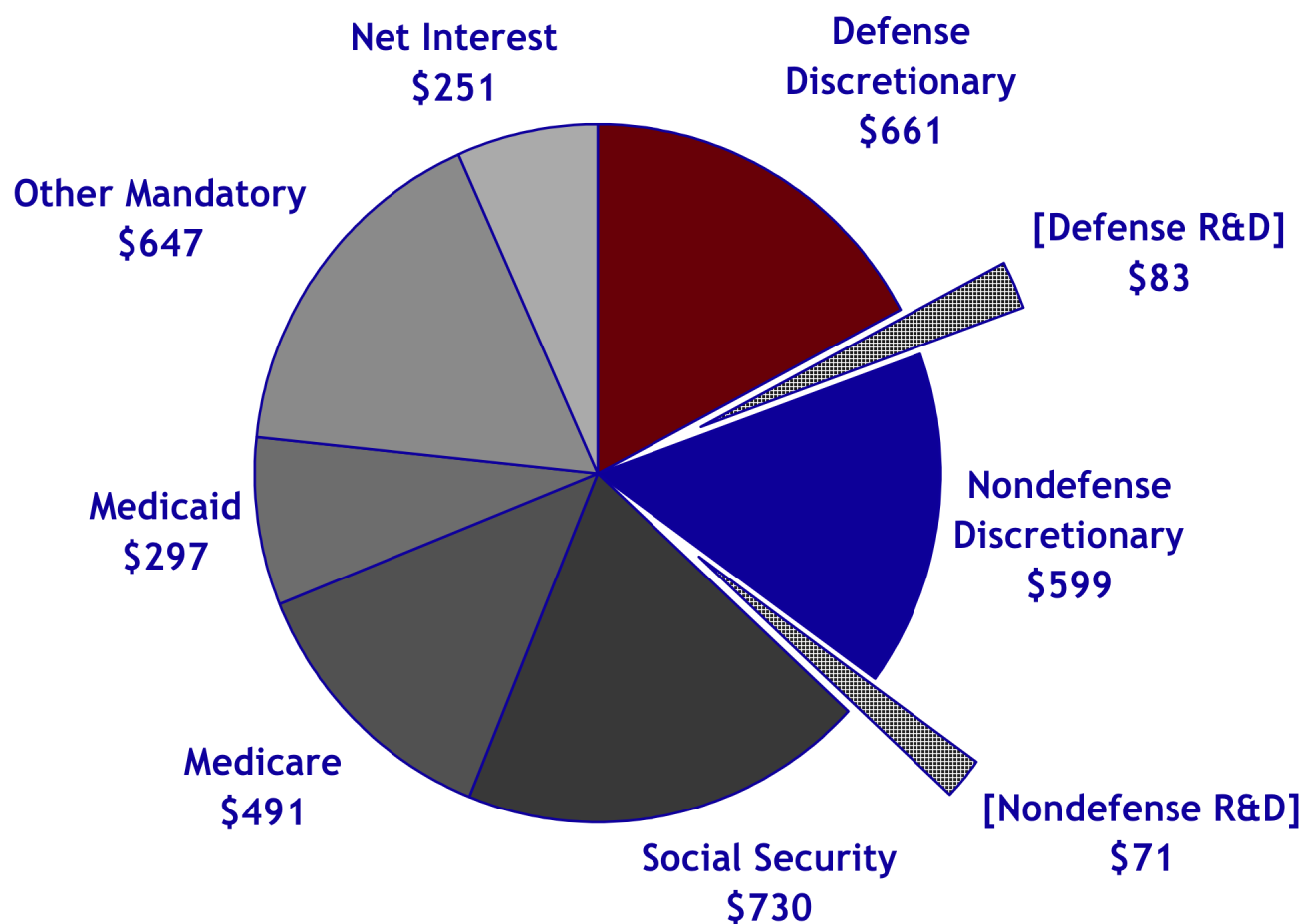


Credit: Washington Post, www.washingtonpost.com/obama-budget

Composition of the Proposed FY 2011 Budget

Total Outlays = \$3.8 trillion

outlays in billions of dollars



Source: *Budget of the United States Government FY 2011.*

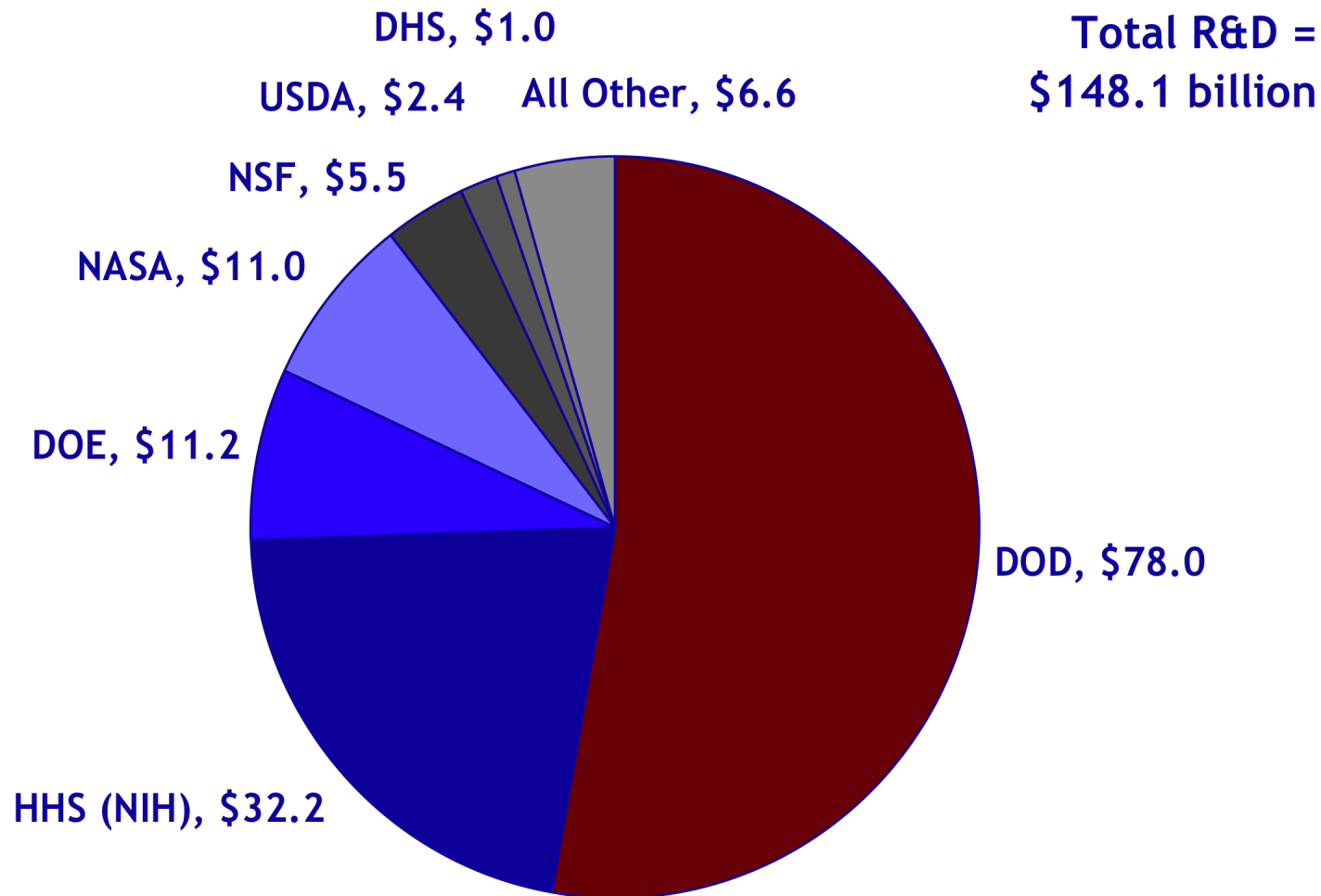
Projected unified deficit is \$1.3 trillion.

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Total R&D by Agency, FY 2011

budget authority in billions of dollars



Source: OMB R&D budget data, agency budget justifications, and other agency documents.

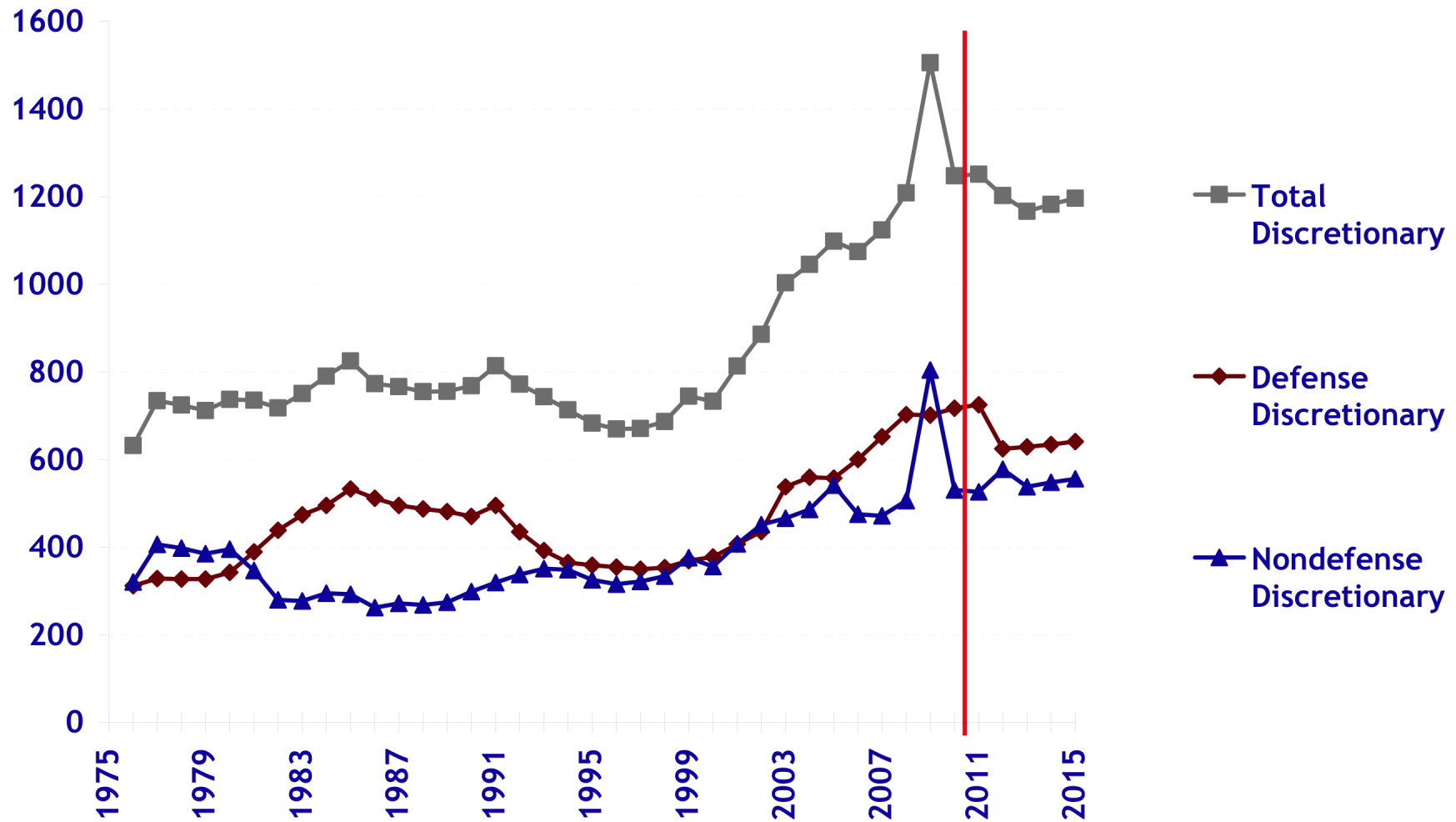
R&D includes conduct of R&D and R&D facilities.

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Trends in Discretionary Spending

outlays in billions of constant FY 2010 dollars



Source: *Budget of the United States Government, FY 2011.*

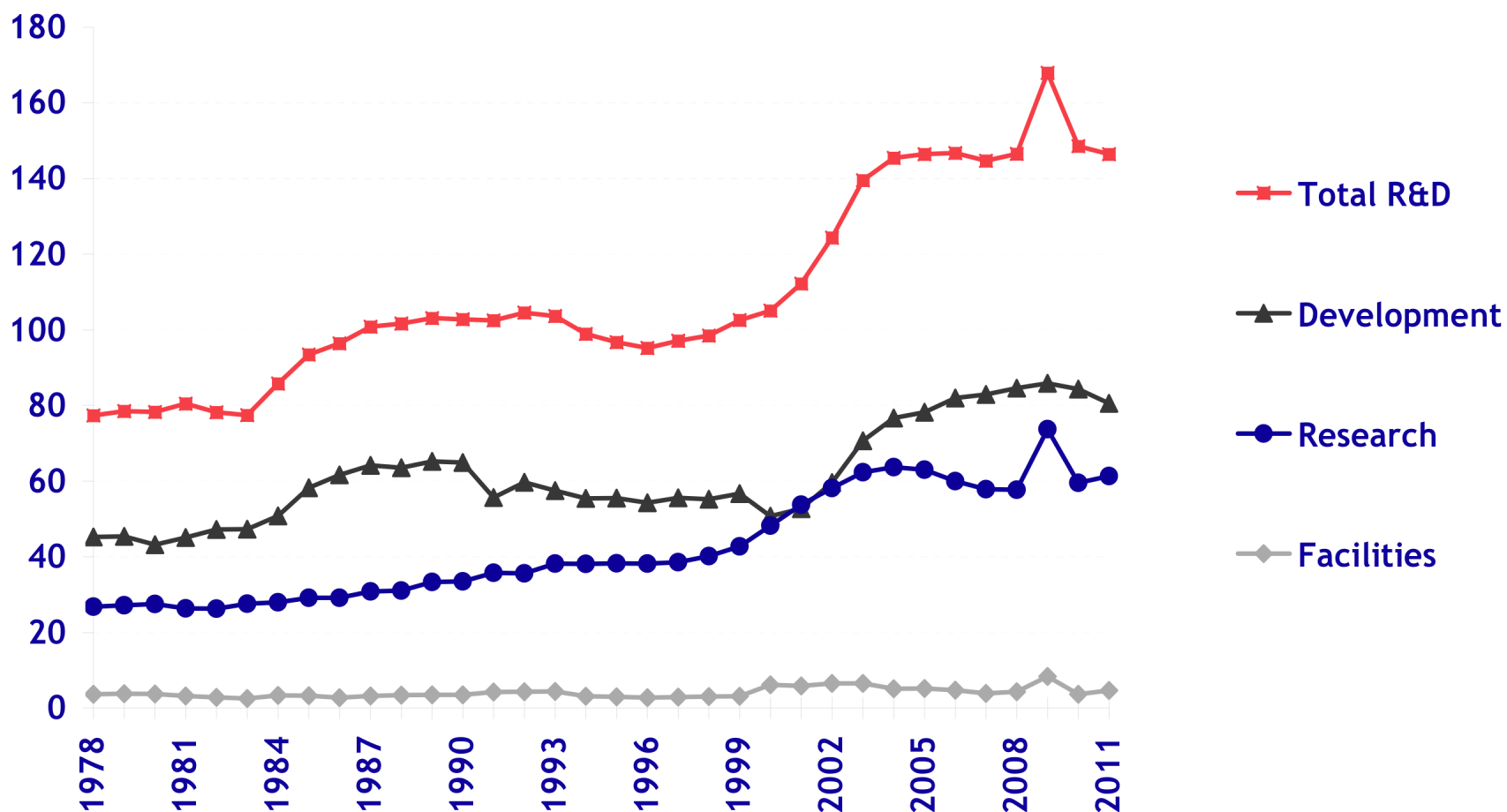
FY 2010-2015 data are budget projections.

© 2010 AAAS



Trends in Federal R&D

in billions of constant FY 2010 dollars



Source: AAAS analyses of R&D in annual AAAS R&D reports.

FY 2011 figures are latest AAAS estimates of FY 2011 request.

R&D includes conduct of R&D and R&D facilities.

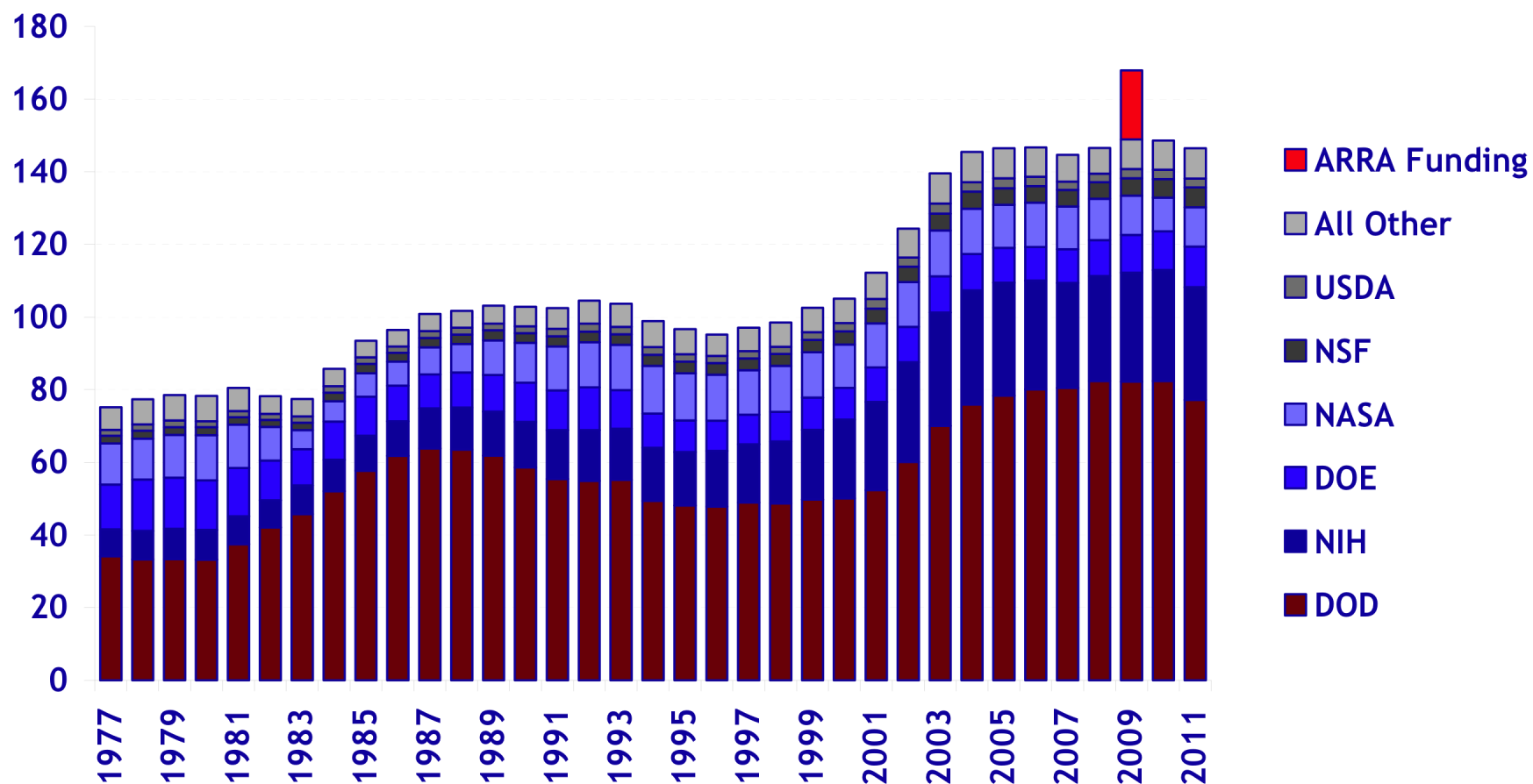
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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Trends in R&D by Agency

in billions of constant FY 2010 dollars



Source: AAAS Report: Research & Development series.

FY 2010 and FY 2011 figures are latest estimates.

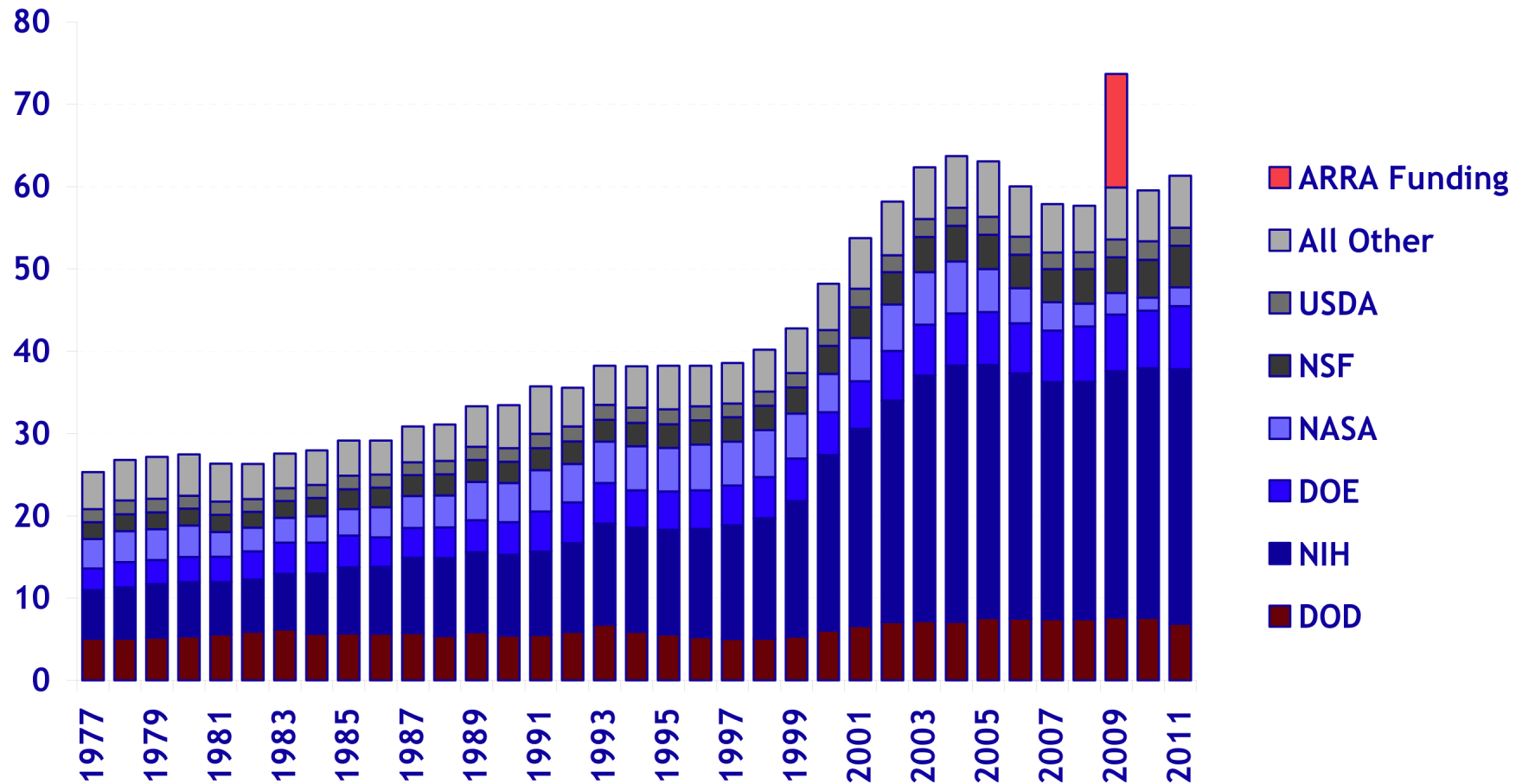
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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Trends in Research by Agency

in billions of constant FY 2010 dollars



Source: AAAS Report: Research & Development series.

FY 2010 and FY 2011 figures are latest estimates.

Research includes basic research and applied research.

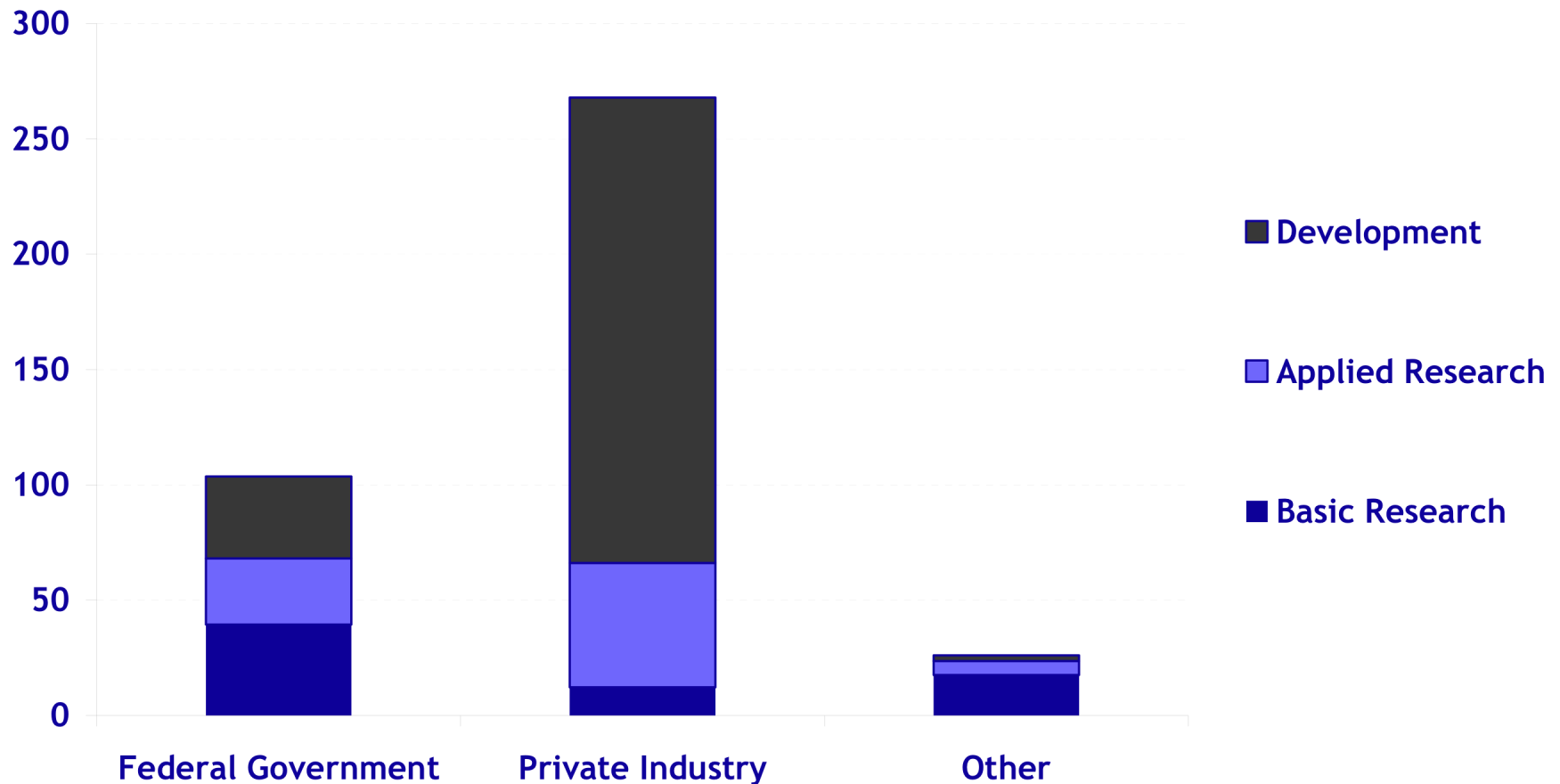
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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Character of R&D, 2008

outlays in billions of dollars



Source: NSF, Division of Science Resources Statistics,
National Patterns of R&D Resources (NSF 08-318)

Figures are preliminary.

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Budget priorities



- Jobs, Jobs, Jobs
- Climate change research
- Renewable energy research
- STEM education

Our challenge: Astronomy and Astrophysics are not viewed as part of the national agenda or contributing to the country's economic growth.

Astronomy in the FY 2011 budget request

- NSF – overall 8% increase. AST got a 2.5% increase.
- NASA – Science up 11.4%
(Earth Science: +26.8%; Planetary: +10.8%;
Heliophysics: +2.3%; Astrophysics: -2.5%)

BUT – this is just the budget *request*.

Human Space Flight Program

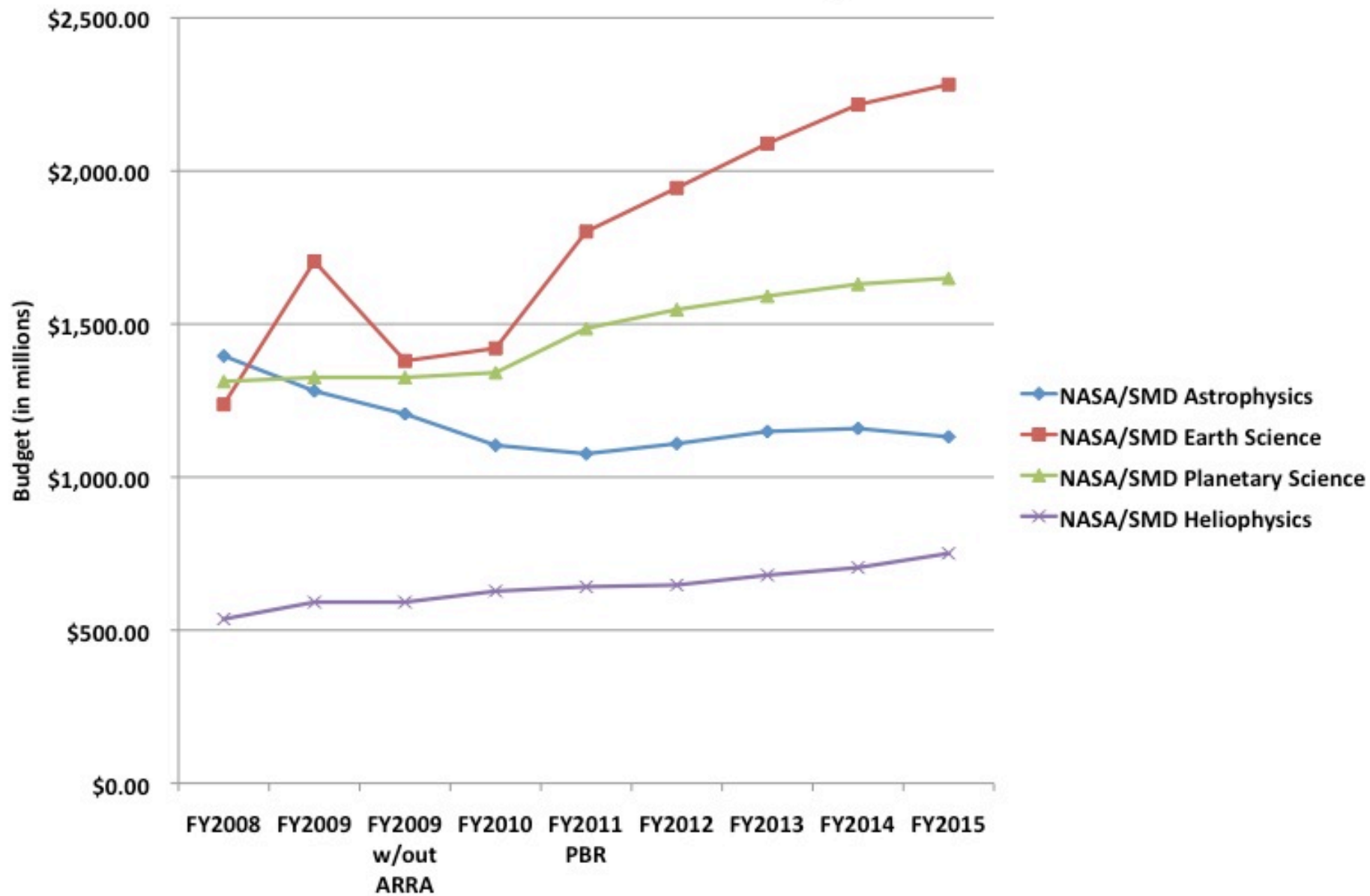


- ❑ Retires the shuttle.
- ❑ Ends the Constellation program.
- ❑ Extends International Space Station to 2020.
- ❑ Promotes commercial space launches.
- ❑ Not well received on the Hill...could be DOA
- ❑ Obama to reveal details in Florida later this month...stay tuned.

NASA top-level budget

	FY2009	ARRA	FY2010	FY2011	% change: Fy2010-Fy2011
Total	17,782	1002	18,724	19,000	+1.5
Science	4,503	400	4493	5005	+11.4
Aeronautics	500	150	507	579	+14.2
Exploration	3,505	400	3,780	4,263	+12.7
Space Ops	5,765		6,181	4,888	-21
Education	169		184	146	-20.6

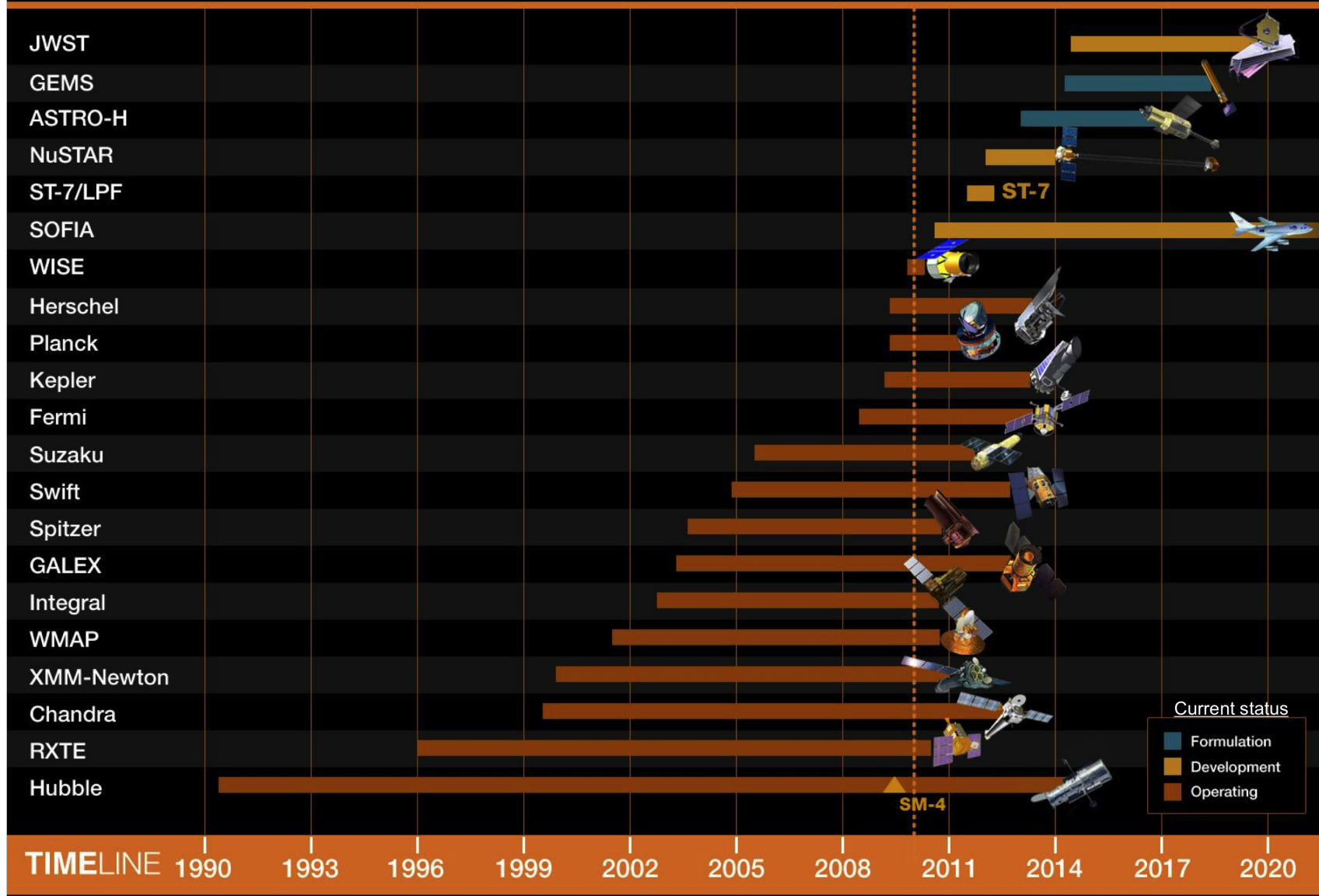
NASA Science Funding



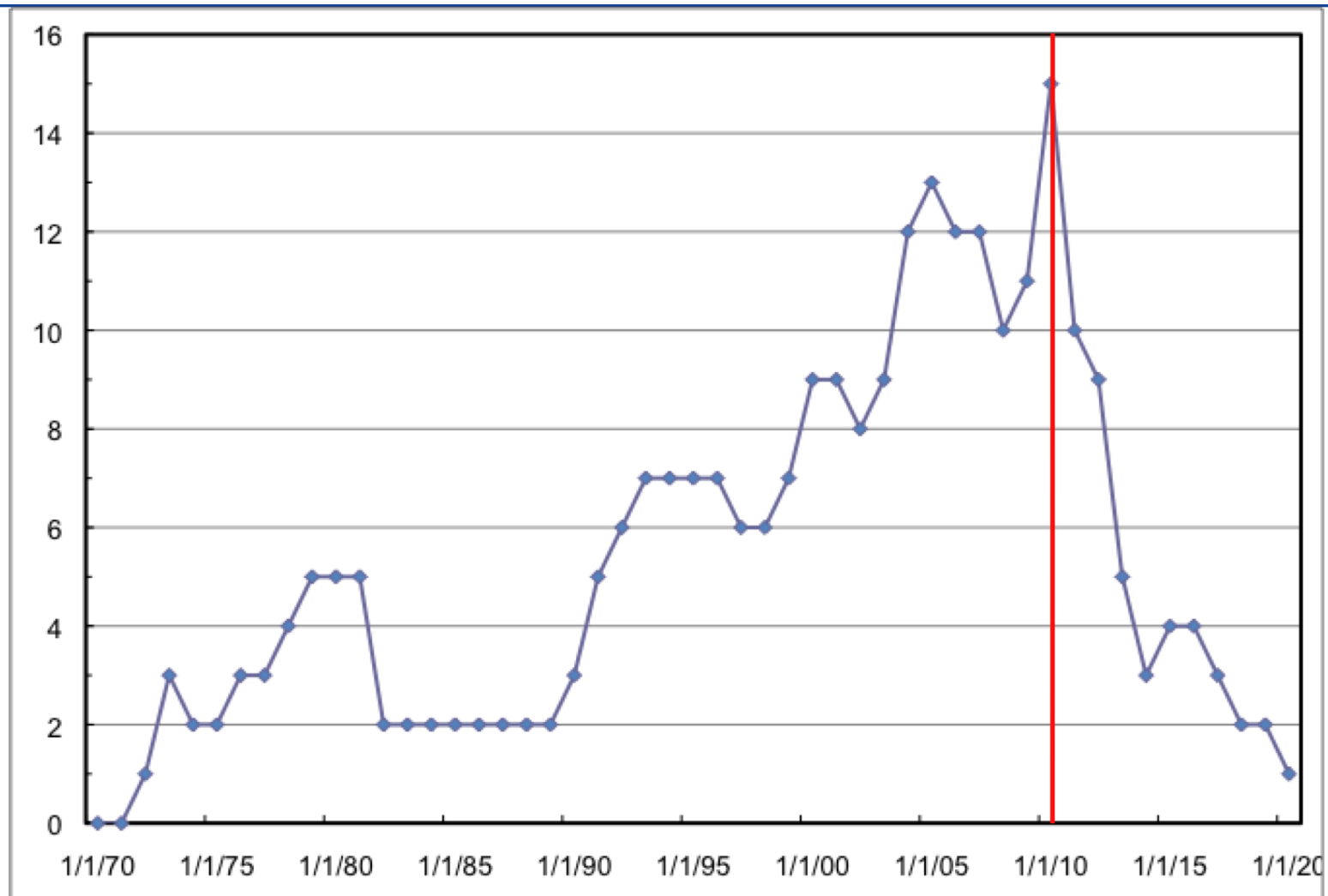
Some details on the astrophysics budget

Budget Authority (\$M)	FY2009 Actual	FY2010 Enacted	FY2011 PBR	FY2012	FY2013	FY2014	FY2015
	1304.9	1103.9	1076.3	1109.3	1149.1	1158.7	1131.6
Astrophysics Research	136	149	156.1	178.1	188.4	194.6	199.6
Cosmic Origins	850.0	684.1	687.7	669.4	667.5	640.5	599.2
Physics of the Cosmos	111.1	116.8	103.3	114.4	151.7	176.4	202.0
Exoplanet Exploration	72.1	46.2	42.5	54.1	83.0	93.8	117.6
Astrophysics Explorer	135.7	107.9	86.7	93.3	58.5	53.3	13.2

Astrophysics Missions timeline



NASA Astrophysics Operating Satellites



NSF News

	FY2009 Actual	FY2009 ARRA Actual	FY2010 Estimate	FY2011 Request	Change over FY2010
AST	\$228.67	\$85.80	\$245.69	\$251.77	\$6.08 (2.5%)

- ARRA funding → award rate went from 21% to 36%
- ALMA funding ramp-up, Arecibo funding decreases as per Senior Review
- New AST Director

Astronomy Inspires



Astronomy is well-liked at the highest levels...

(but what is he looking at with the spotlights on?)

FY2012 Outlook



- ❑ OSTP, OMB, and Agencies anxiously awaiting the Decadal Report.
- ❑ Strong message from OSTP about a “coherent message” from community
- ❑ International collaborations increasingly common
- ❑ Coming dry season

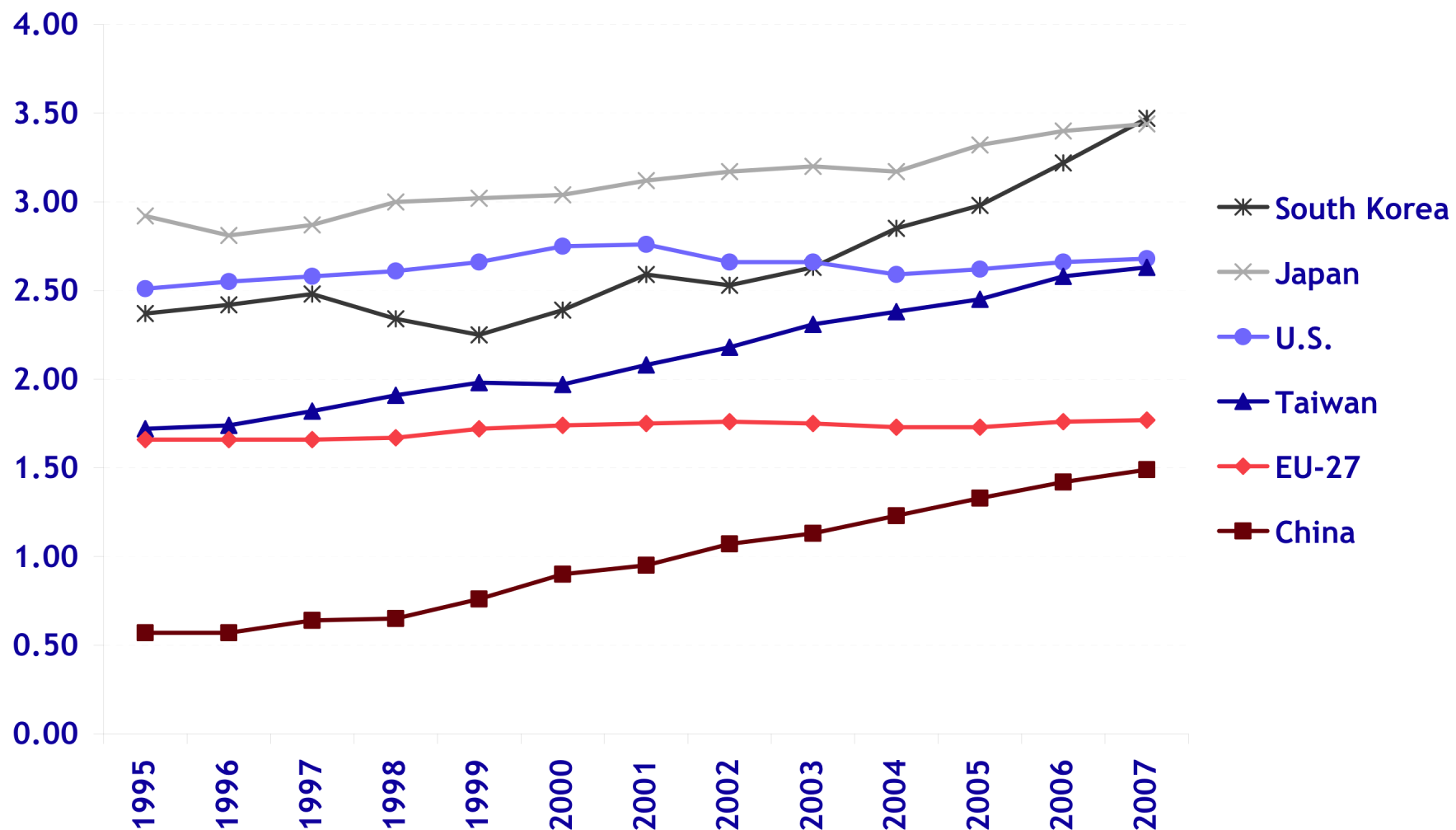
Our challenge



- ❑ Science funding is a **tiny** fraction of the overall total. Also optional!
- ❑ Competes with other discretionary spending.
- ❑ The budget is complex and complicated, but not impossible to understand.
- ❑ Now, more than ever, scientists must participate in this clumsy and repetitive process...
- ❑ Resources are available to enable you to have an impact.

National R&D Investment

percent of GDP



Source: OECD, Main Science and Technology Indicators, May 2009.
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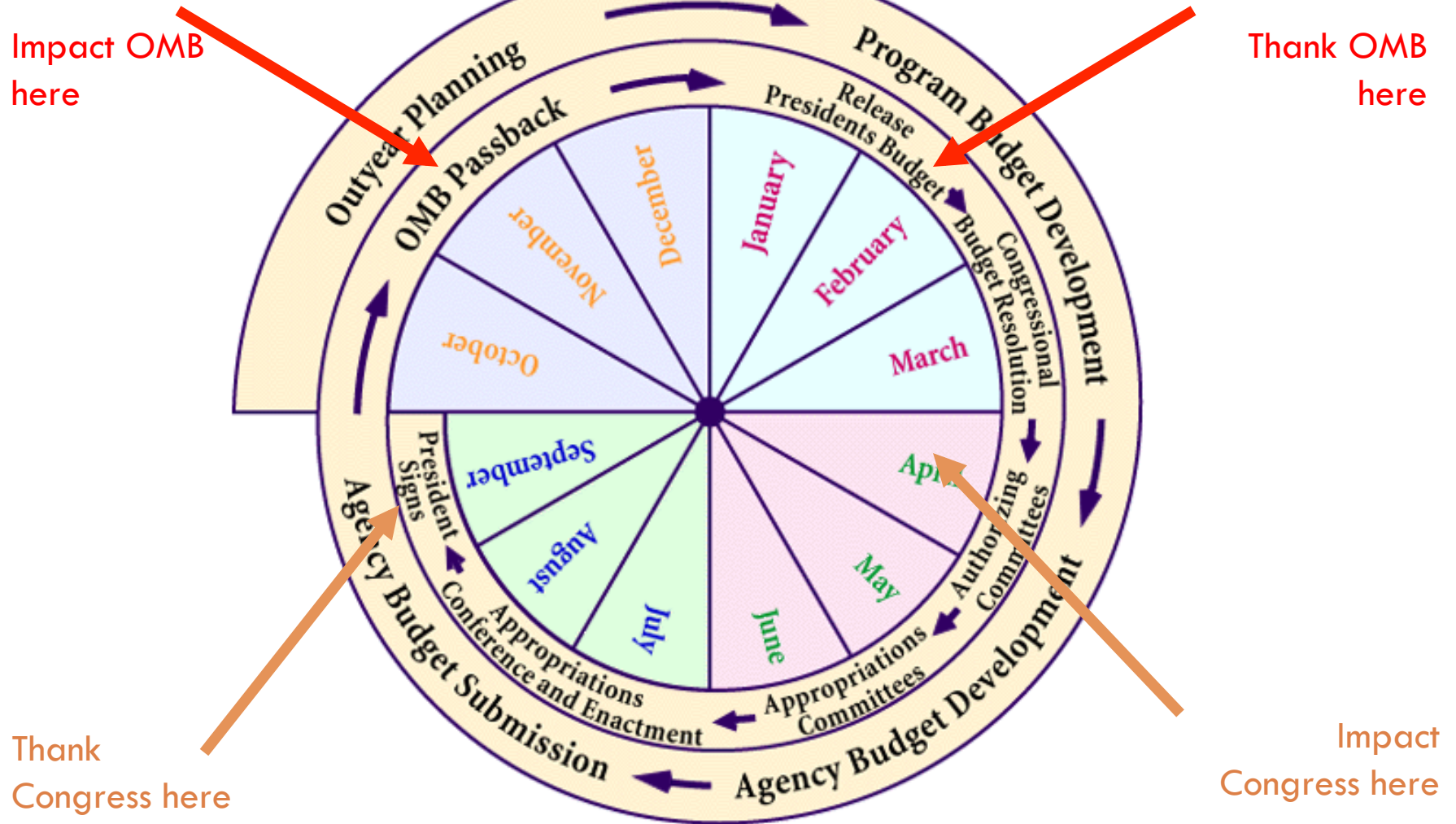


What can you do?



- Write letters – often and regularly, write when you don't want something, thanking members for their work.
- Visit local/DC offices of your members of Congress, know at least the local office staff if not also DC science staff.
- Invite them to your institution regularly, coordinate press coverage, give awards, donate to campaigns.
- Participate in forming public opinion, letters to the editor, op-ed pieces etc.
- Educate the public and get them on our side at every opportunity.

The Budget Cycle



Mental Checklist for Visits



- ☐ What is my message? Is it proactive and positive? Do I have a summary sheet of talking points to leave behind?
- ☐ Is there a current bill that is relevant?
- ☐ What about the big picture...how does my message fit into national priorities?
- ☐ Who am I representing? Myself? My employer? My kids?
- ☐ Can I pitch my case in terms of local concerns?
- ☐ Am I communicating a consensus view? Can I prove it?
- ☐ Have I profiled my audience?

Some General Tips



- ❑ Do no harm (repeat) (repeat again).
- ❑ Stick to the Decadal Survey. It separates us from other disciplines like night and day.
- ❑ Make an effort. A silent constituency is a nonexistent constituency.
- ❑ If you don't know, say so.
- ❑ Science staff may not be experts, but are very smart (and influential!).
- ❑ Don't let visits or communications be a one-time deal, make it a part of your professional life...the farmers do, the veterans do, the scientists should.

Resources

- ❑ [Me \(marvel@aas.org\)](mailto:marvel@aas.org)
- ❑ www.aas.org/policy
- ❑ www.nasa.gov/budget
- ❑ www.nsf.gov/about/budget/
- ❑ www.aps.org
- ❑ www.aip.org
- ❑ www.aaas.org/spp

- ❑ www.house.gov (House Science Committee and House Appropriations Subcommittee)
- ❑ www.senate.gov (Commerce, Science, & Transportation; CJS Appropriations Subcommittee)
- ❑ www.thomas.loc.gov

- ❑ NPR, CNN, NYT, Wash. Post, NASA Watch!

AAAS Budget Analysis



- ☐ Best source of information on the budget
- ☐ Special chapters on agencies
- ☐ Special chapters on disciplines
- ☐ Special chapters on trends and budget context